ROMER'S ADVERSARIA.

Ole Römer's Adversaria, med Understöttelse af Carlsbergfondet udgivne af det Kgl. Danske Videnskabernes Selskab. By Thyra Eibe and Kirstine Meyer. Pp. v+271. (Köbenhavn: Bianco Lunos Bogtrykkeri, 1910.)

AMONG astronomers Ole Römer (1644–1710) occupies a peculiar position. He was held in high repute among contemporary men of science, as may be seen from the fact that Newton and he were the first astronomers to be enrolled among the eight foreign associates of the Paris Academy of Sciences, and were elected on the same day. To posterity he is known as the discoverer of the gradual propagation of light, and as the man who introduced the use of (if he did not invent) the transit instrument and the transit circle. And yet his published writings only fill a few pages, and the observations he made with instruments far superior in design to those of his time, were not printed, and nearly all of them perished not long after his death. There is, therefore, every reason to welcome the publication of his common-place book, which has been brought out just two hundred years after his death.

Like every other book of its kind, the present book of Adversaria deals in a scrappy way with a great variety of subjects, and it shows what chiefly occupied Römer's mind, especially during the last ten years of his life. We see him as a practical astronomer, as a physicist, and as a man who had for many years served his country well by reorganising the system of weights and measures, getting the Gregorian calendar introduced, and preparing a uniform system of land taxation. But though these various occupations, which gradually came to fill most of his time to the great loss of science, are now and then alluded to in the present volume, they do not fill many pages in it. It looks as if Römer was in the habit of taking refuge in his commonplace book when he wanted to refresh his mind after his hard work as Burgomaster and Chief of Police of Copenhagen. To give a full account of the contents of his notes is not possible in a limited space: we can only give the reader some idea of the kind of subjects dealt with. An important section on thermometers, dating from 1702, has already been described in NATURE, (vol. lxxxii., p. 296). Römer appears to have been the first to construct thermometers with two fixed points, marking the temperatures of melting snow and of boiling water, and he was the inventor of the scale known as Fahrenheit's.

Turning to astronomical matters, we find Romer to have been a follower of Descartes in his views on the construction of the universe, though his own discovery about light did not exactly harmonise with Cartesian ideas. He inquires at what distance a planet or satellite would have to be from the central body according to the third law of Kepler in order that its period of revolution may equal the period of rotation of the central body. In the case of a planet he finds the distance equal to 37 semidiameters of the sun, in the case of a satellite of the earth 6½, and for a satellite of Jupiter 2 semidiameters of the respective planet. This, he thinks, may be made to agree with the vortex theory by assuming that radiation from the central body impedes the rotation of the ether, and this radiation, being naturally much more powerful from the sun, causes its influence to be felt at a much greater distance than that at which the radiation of a planet is perceptible. He shows himself interested in solar phenomena by calculating the apparent position of the sun's axis, and of the path of sun-spots for every 7½° of longitude of the sun, having first determined the inclination of the sun's equator and the place of the node with fair accuracy from his own and La Hire's observations. It will be remembered that the sun's equator was in those days often used as a fundamental plane or Via Regia of the solar system. He calculates the transit of Mercury of May, 1707, from Kepler's elements and observations by Hevelius of the transit of May, 1661. He calculates the solar eclipse of September 13, 1708, for Copenhagen, and Holum in Iceland, and gives rules for the prediction and graphic representation of an eclipse. The transit instrument in the prime vertical, of which he had introduced the use, is employed for the determination of the vernal equinox of 1702, and he examines the consequences of errors of observation in the transit, and shows how to determine the error of collimation by reversing the instrument.

The above examples, which could easily be multiplied, will show that the two ladies who have edited this book have done good work by bringing it to light. There is a useful index and an excellent table of contents, and every care seems to have been taken to produce an accurate edition of the old manuscript. The few Danish words or sentences occurring here and there might have been translated in foot-notes for the convenience of readers not acquainted with that language.

J. L. E. D.

GALL-FLIES AND OTHERS.

Das Tierreich. Eine Zusammenstellung und Kennzeichnung der rezenten Tierformen. Edited by F. E. Schulze. 24 Lieferung. Hymenoptera. Cynipidæ. By Prof. K. W. von Dalla Torre and Prof. J. J. Kieffer. Pp. xxxv+891. (Berlin: R. Friedlander and Son, 1910.) Price 56 marks.

THIS work forms a worthy volume of the series of zoological works published under the general title of "Das Tierreich," by Messrs. R. Friedlander and Son, of Berlin. It is an extension of the two volumes by Dr. Kieffer in André's "Species des Hyménoptères d'Europe et de l'Algérie." Dealing as it does with the Cynipidæ of the whole world, and containing descriptions of all the known genera and species, the book is indispensable to students of the Cynipidæ. Theodore Hartig was the pioneer of the scientific study of the group. He placed the classification on a proper basis, and was the first to point out the threefold habits of the species—gall-makers, inquilines, and parasites. After him came Giraud, Schenk, and, above all, G. L. Mayr, who made the identification of the galls easy by the publication of beautifully illustrated works on the species of Central Europe, as well as a monograph on the guest-flies (Synergi).

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Then came the epoch-making discovery by Dr. Adler of the existence of alternations of generation—that a spring bisexual form was followed by an autumnal unisexual one, the two forms having totally different galls.

The volume commences with a list of the authors who have published separate works, and of the titles of the journals and transactions of scientific societies in which papers have appeared, the total number being 252, beginning with Malpighi in 1675. The titles of papers in magazines and transactions are not given. If they had we should have had the names of T. A. Marshall, E. A. Fitch, Prof. J. W. H. Trail, and other workers at British cecidology, besides the seven British authors given in the catalogue. We notice that while the list contains the French translation of Adler's papers, no mention is made of the English one by Mr. Standen. Next we have a "systematic index" of the genera and species, followed by the descriptions of the subfamilies, genera, and species, the whole concluding with a good index of the genera and species, but not of the plants, and a "Nomenclator generum et sub-generum." There are no figures of entire insects, but there are some illustrating the structure in the introduction, while there are 398 wood-cut illustrations of galls.

The authors divide the family into ten subfamilies and 126 genera, besides two doubtful ones; describe fully 1281 species, as well as 102 subspecies; in addition there are 212 species which have been too briefly described for recognition, and of which the original descriptions are reprinted. Some changes in generic nomenclature are made. Allotria, West., and Xystus, Htg., its synonym, are suppressed, both being preoccupied. In place of them Dr. Kieffer adopts Charips, a MS. name of Haliday, first used by Marshall. The name of Diplolepis is revived after long disuse, it replacing Dryophanta. On the other hand Ashmead considers it to be the same as Diastrophus. The system of subgeneric names and trinomials for the species with well-marked varieties is adopted. Thus we have Eucœla and Cothonaspis, both with nine subgenera, the latter being genera with Foerster and Ashmead. This method, in some cases, leads to a species having four names, *e.g.* we have *Eucoila Psichacra Marshalli Marshalli* for the typical form of Cameron's species, and *Eucoila Psichacra Marshalli rufo-notata* for the variety.

An interesting fact in the biology of the parasitic Cynipidæ is that some species are found in ants' nests. Long ago Westwood bred *Charips victrix* from the rose aphis, and as many other species of the same genus have also been bred from plant-lice, it might fairly be concluded that the genus was a beneficial one. There is now, however, reason to believe that Charips is a hyperparasite, destroying, not the aphis, but the beneficial Braconid which preys on it. If that is so the species must be looked upon as injurious. The present writer has seen *Charips victrix* ovipositing in plant-lice killed by Aphidius, which pupates in the lice, the bodies of which become dried, inflated, and are attached to the leaf by the parasites. *Cothonaspis zig-zag* is another injurious hyperparasite, it destroying *Phora aeletiae*, the parasite of the injurious cutworm of the cotton. Among the habitats of the Parasitica is the sea-shore, where two British semiapterous species are found at high-water among seaweed.

It is curious how the Cynipidæ form their galls on certain plants more than on others. The oak in Europe and in North America is the predominant food-plant. In Europe *Quercus pedunculata* harbours ninety-nine species, *Q. pubescens* seventy-nine, and *Q. sessiliflora* ninety-six. After the oak come the Rosaceæ—Rosa, Rubus, Potentilla. The poppy has two species in the fruit and one in the stem. It is remarkable that the willows, on which there are so many dipterous and saw-fly galls, have not one species of Cynipidæ attached to them.

As regards the distribution, Dr. Kieffer gives some curious examples of the unequal manner in which some genera are distributed in Europe and North America. Callirhytis has four species in Europe, in America fifty-two. Rhodites has twelve Palæarctic and seventeen Nearctic, while Lytorhodites is exclusively Nearctic, as is also Amblybolyps with twenty-four species. A few species are found in Europe and North America, *e.g.* our "begeguar" and *Aulax latreillei* on *Glechoma hederacea* as in Europe, while *Rhodites eglanteriae* is recorded from the West Indies. Solanum should be deleted from the list of food-plants, it being now known that the galls of *Tribalia batatorum* came from the rose and not from the potato. Ashmead is no doubt correct in considering Tribalia to be identical with Lytorhodites.

There are one or two points in the work which concern our British species—Aulax, Hartig, is split up into two—Aulax (Kieffer retains the old, incorrect spelling, Aylax) with *latreillei*, Kief. (*glechomae* of Cameron's monograph), *hypochoeridis, papaveris, minor, scabiosae*, and *Fitchi*; and Aulacidea with *hieracii* and *graminis*. We doubt if *Cynips kollari*, our common "marble gall" fly, is dimorphic, and that *Andricus circulans* (a Turkey-oak species found in Britain only in Kew Gardens) is its sexual form. Our own experiments appear to show that it is agamic, while, if *A. circulans* were its sexual form, it surely should be equally common and as widely distributed.

In conclusion, we have to congratulate cecidologists on the appearance of this admirable and thorough work, which will be as useful to the beginner as to the advanced student in all parts of the world.

P. C.

THE CRYSTALLISATION MICROSCOPE.

Das Kristallisationsmikroskop und die damit gemachten entdeckungen insbesondere die der flüssigen Kristalle. By Prof. O. Lehmann. Pp. iv+112. (Braunschweig: F. Vieweg and Son, 1910.) Price 3 marks.

PROF. LEHMANN is gifted with the pen of a ready writer, and has in recent years poured forth such a voluminous stream of papers and books dealing with the subject of mobile crystals in its many aspects that considerable overlapping and repetition necessarily exists in them. Such criticism may be levied also against the present little book, which first

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